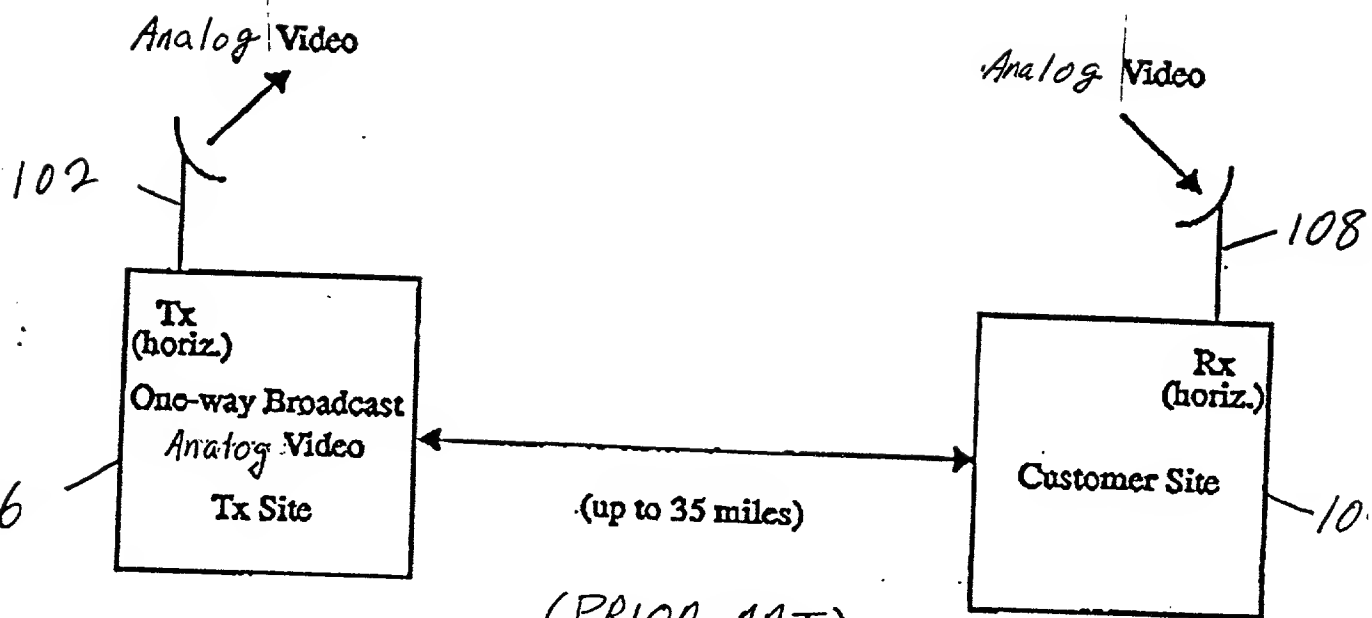


100



(PRIOR ART)  
FIG. 1

Diagram illustrating a video cell system 200' composed of data cells 202'. The cells are arranged in a circular pattern and are numbered 1, 2, 3, and 4. The labels 202'a, 202'b, 202'c, and 202'd point to specific cells within the system.

FIG. 3A

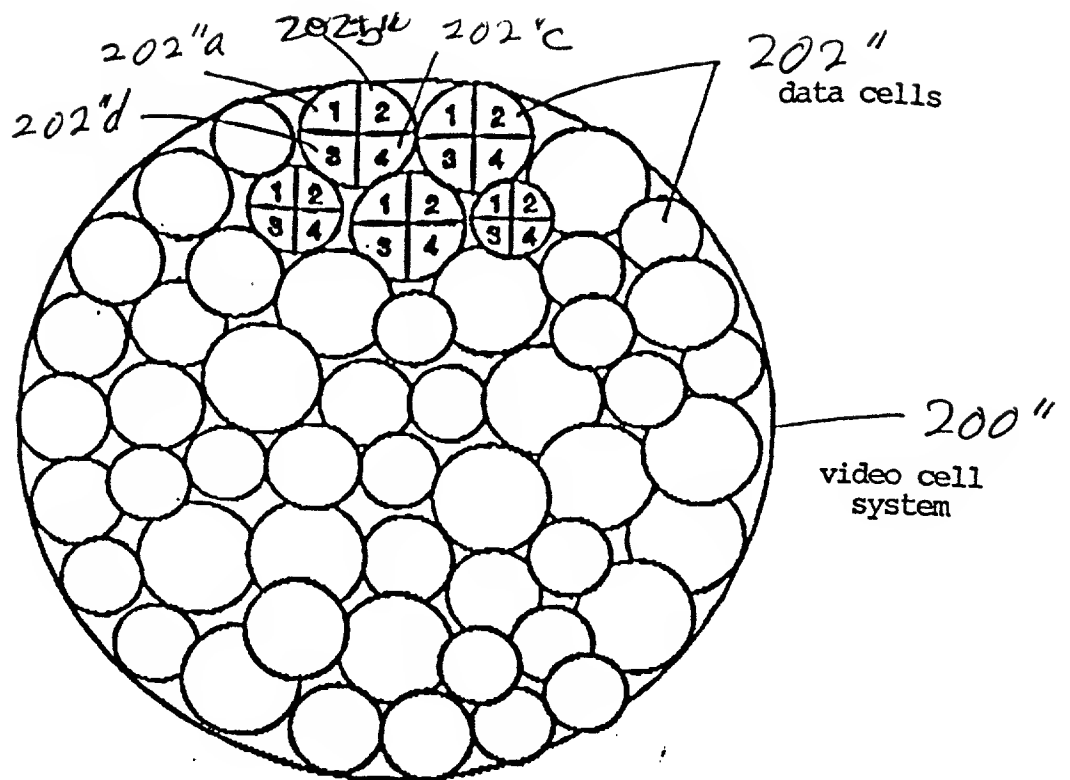


FIG. 3B

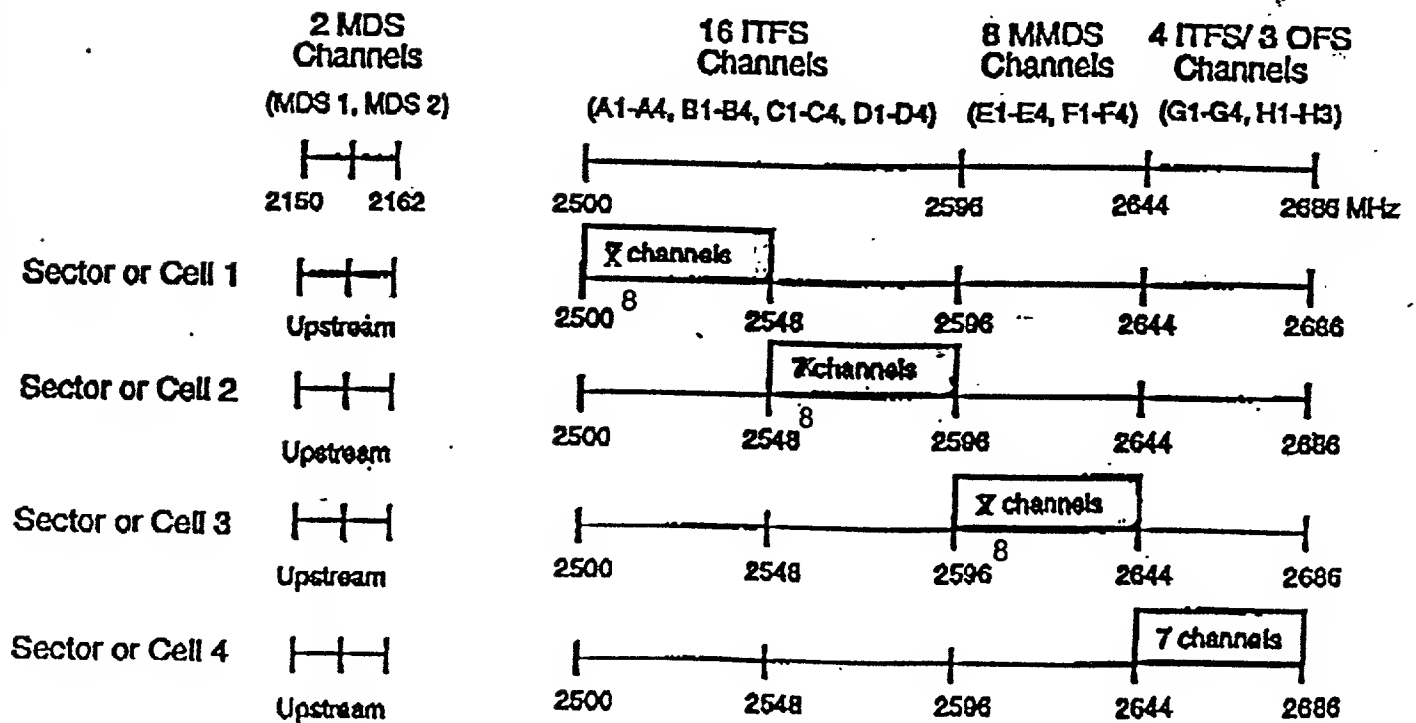


FIG. 4

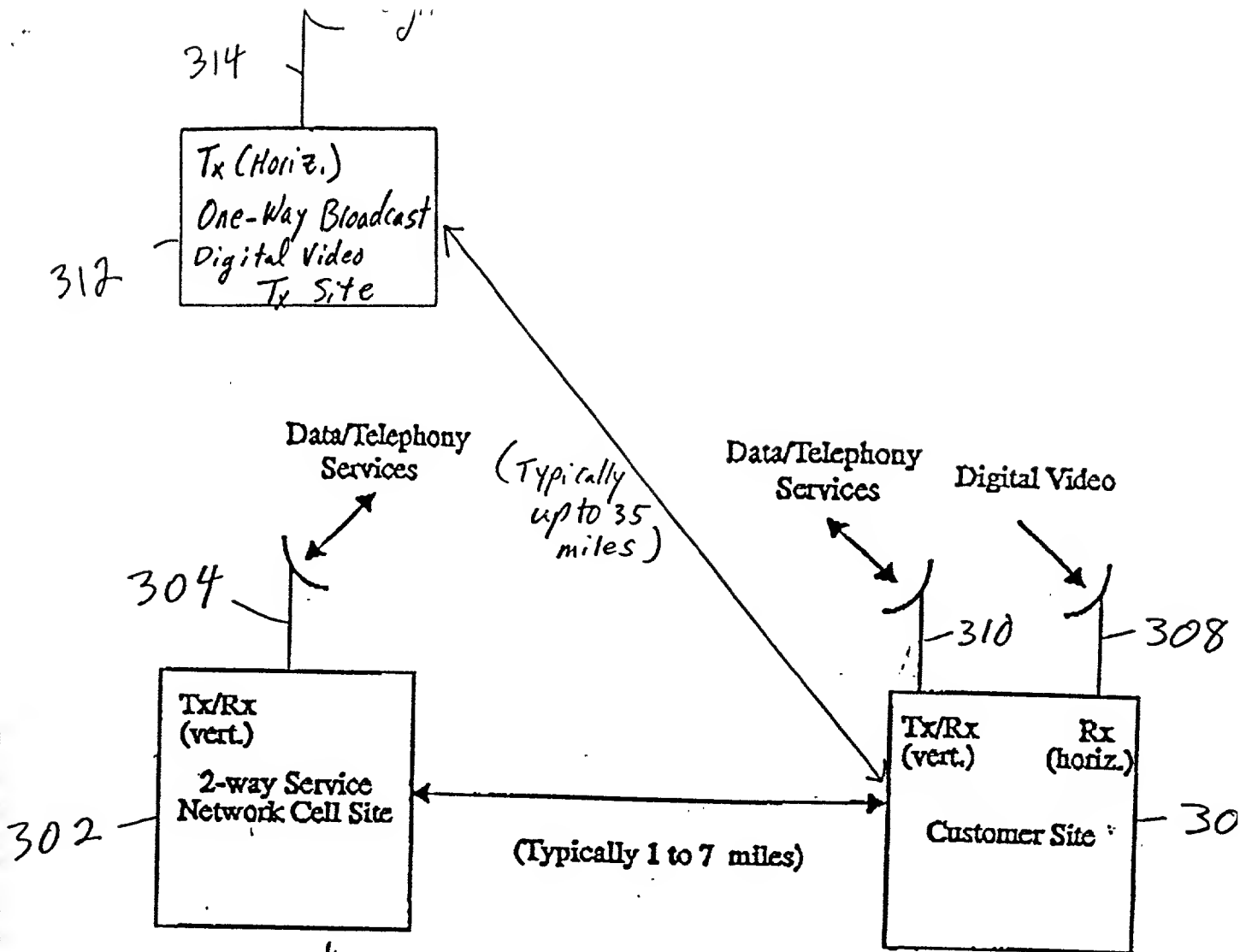


FIG. 5A

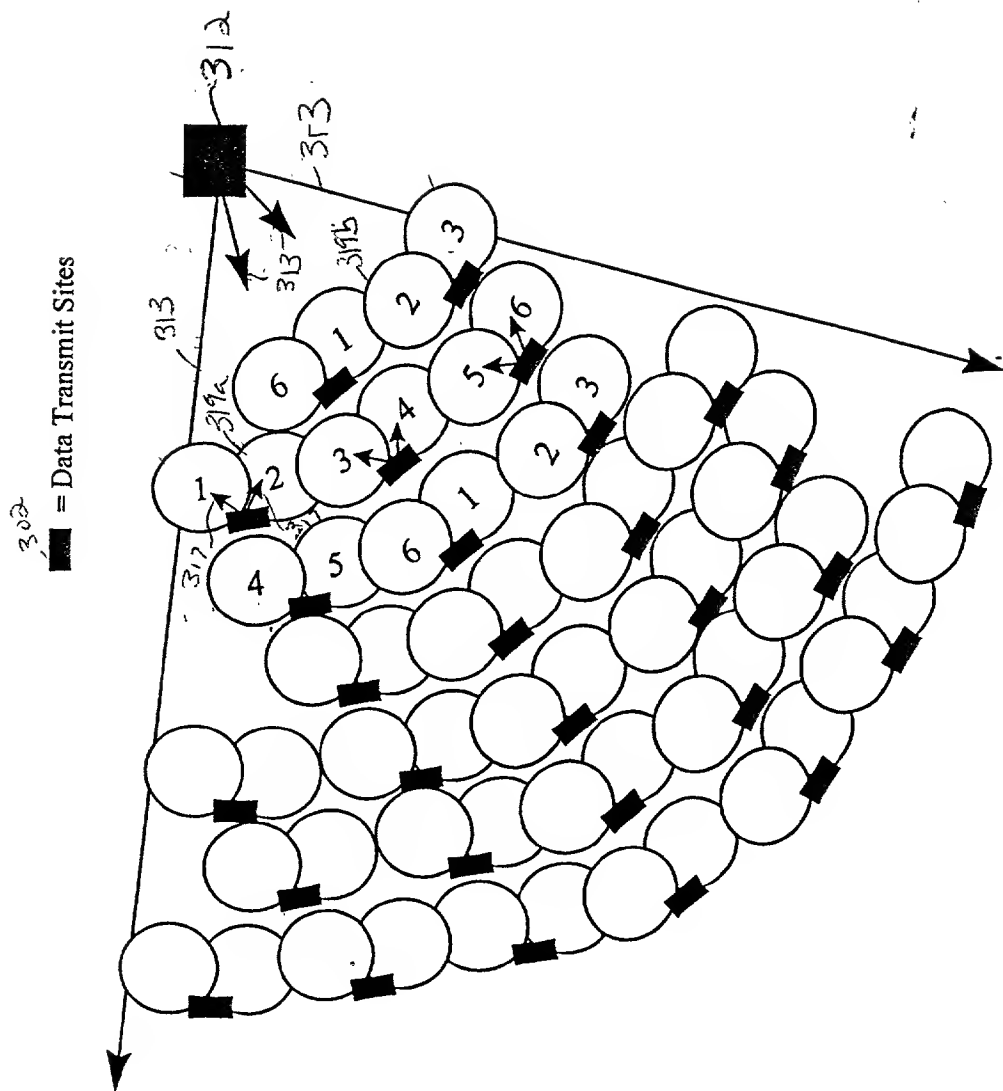


Figure 5b

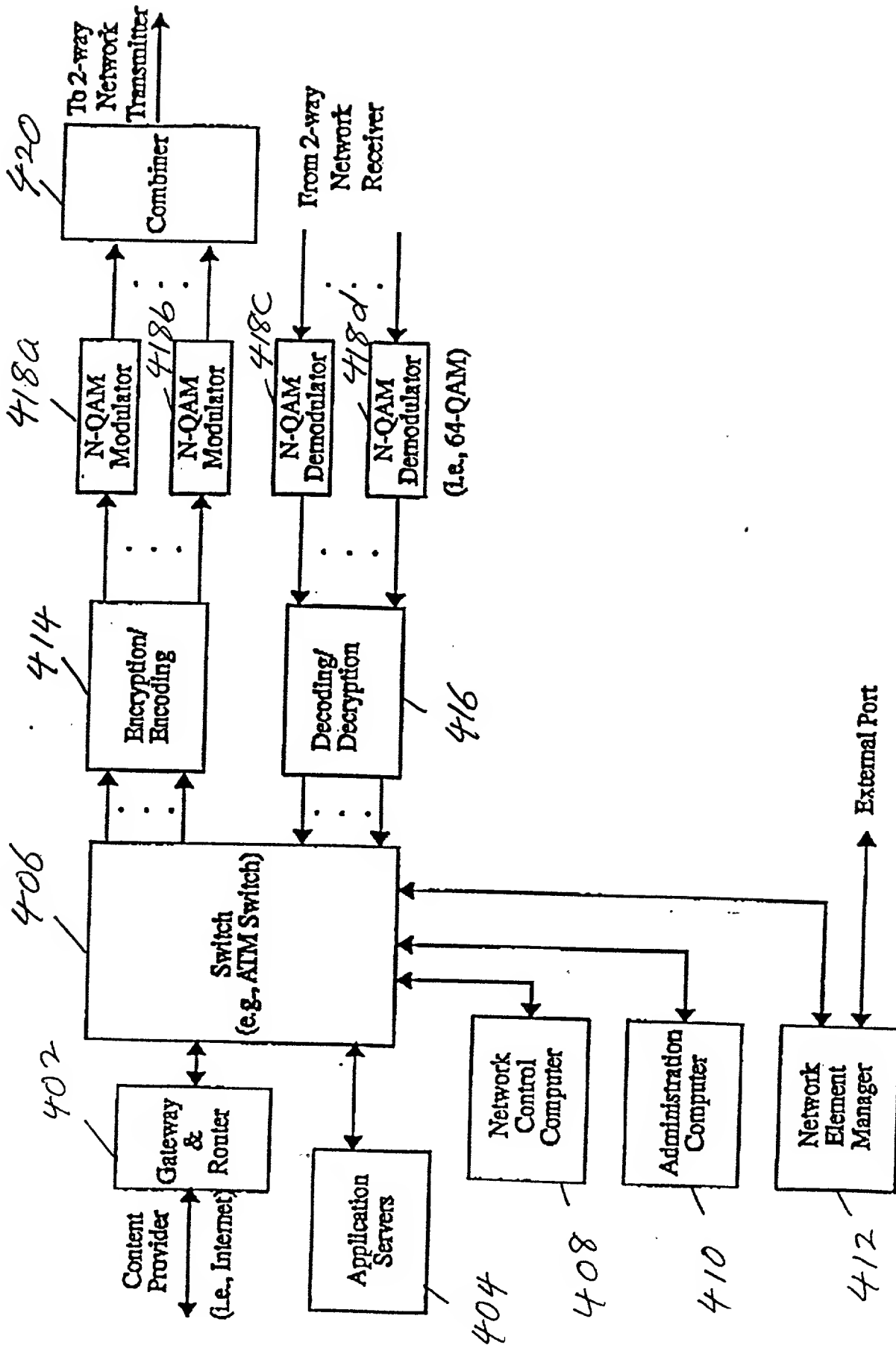


FIG. 6

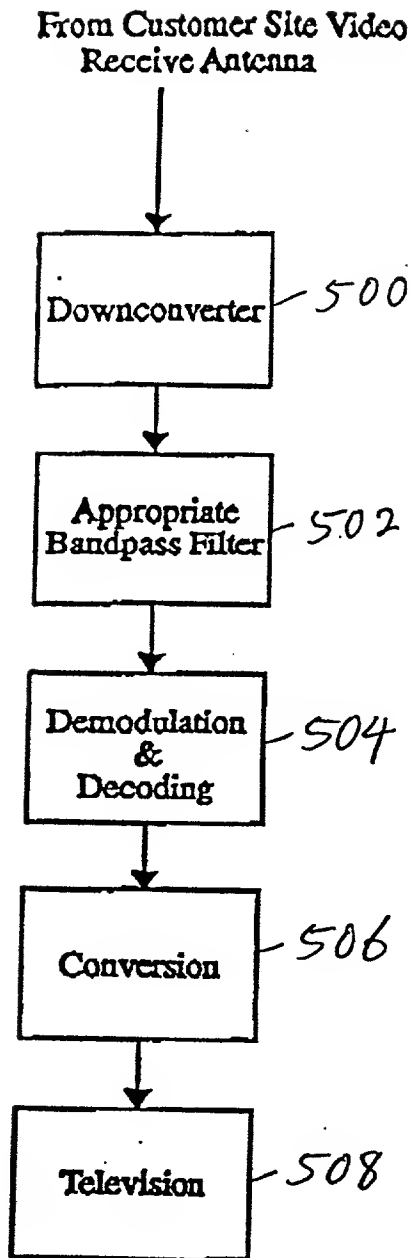


FIG. 7A

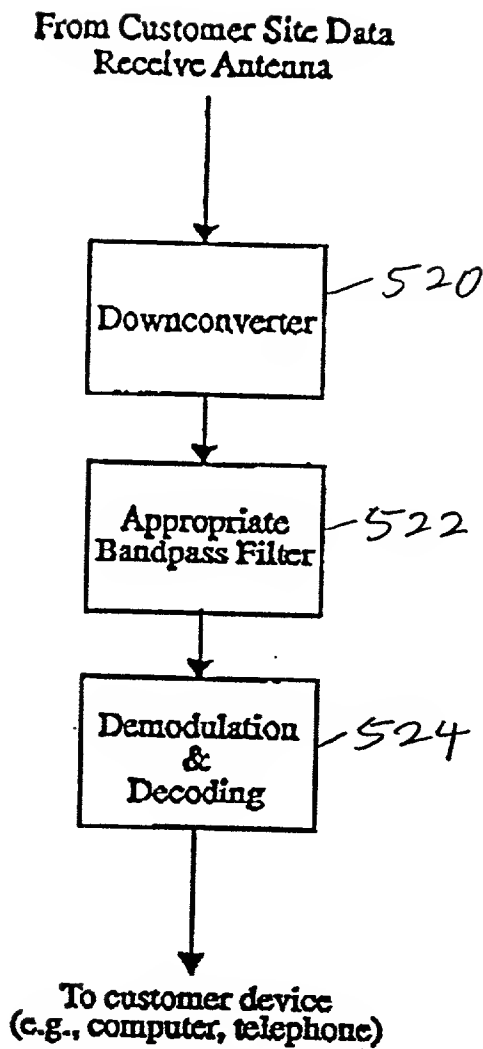


FIG. 7B

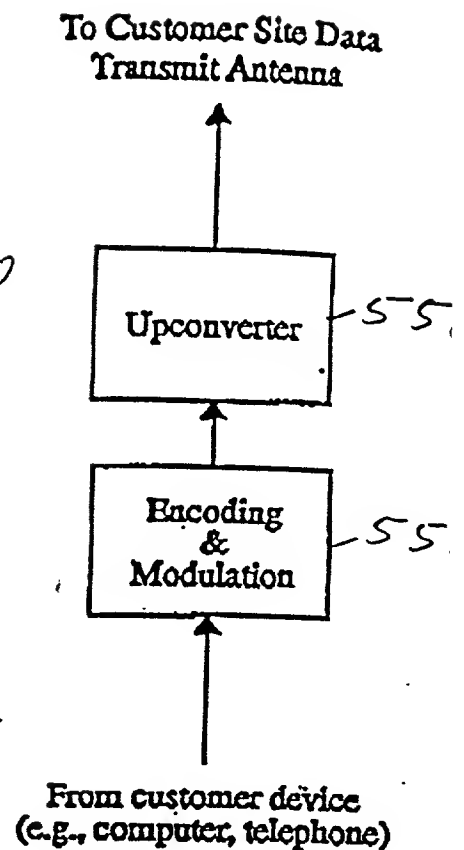


FIG. 7C

|  | Digital Video          | 2-way Service       |
|--|------------------------|---------------------|
| Transmit Power (Average) per Channel:            | 47 dBm                 | 27 dBm              |
| Transmit Antenna gain                            | + 16 dBi               | + 10 dBi            |
| Waveguide Loss                                   | - 4.0 dB               | - 1.0 dB            |
| EIRP/channel                                     | 59.0 dBm               | 36 dBm              |
| Free space loss                                  | - 134.70 dB (35 miles) | - 117.80 (5 miles)  |
| Miscellaneous loss (RFI, Grazing, Aiming, Rain)  | - 3.5 dB               | - 1.0 dB            |
| Signal Level into Receive Antenna                | - 79.2 dBm             | - 82.8 dBm          |
| Receive Antenna Gain                             | + 21 dBi               | + 21 dBi            |
| Signal Level into Downconverter                  | - 58.2 dBm             | - 61.2 dBm          |
| Downconverter Gain                               | + 20 dB                | + 20 dB             |
| Signal Level out of Downconverter                | - 38.2 dBm             | - 41.2 dBm          |
| Noise floor (6 MHz)                              | - 106 dBm              | - 106 dBm           |
| Downconverter Gain                               | 20 dB                  | 20 dB               |
| Downconverter Noise Figure (NF)                  | 2.5 dB                 | 2.5 dB              |
| Noise level out of Downconverter                 | - 83.5 dBm             | - 83.5 dBm          |
| NF Contribution from modem/settop and cable loss | 0.4 dB                 | 0.4 dB              |
| Cable loss                                       | - 3 dB                 | - 3 dB              |
| Noise Level into Modem/Settop Receiver           | - 86.9 dBm             | - 86.9 dBm          |
| Signal Level into Modem/Settop Receiver          | - 41.2 dBm             | - 44.2 dBm          |
| S/N Ratio into Modem/Settop Receiver             | 45.7 dB                | 42.7 dB             |
| S/N Threshold of Demod w/RS FEC (64 QAM)         | 24.5 dB                | 24.5 dB             |
| Available Margin                                 | 21.2 dB (@ 35 miles)   | 18.2 dB (@ 5 miles) |
| *Required Fade Margin (F) for 99.9% avail.       | 18.6 dB                | NA                  |
| Extra Margin for 99.9% @ 35 miles                | 3.3 dB                 | 18.2 dB             |

\* Based on the Bullington model :  $F = -10 \log ((1 - \text{Avail}) / (2.5 * a * b * f * D^3 * 10^{-6}))$ ;  
 $a = 1$ ,  $b = 0.25$ ,  $f = (\text{GHz})$ ,  $D = (\text{miles})$

FIG. 8